

REMARKS

Favorable reconsideration of this application, in view of the following comments and as presently amended, is respectfully requested.

The Abstract is amended by the present response to delete all reference numerals previously recited therein, to be in more proper format under United States practice.

Claims 1-17 and 19-42 are pending in this application. Claim 18 is cancelled by the present response and Claims 39-42 are added by the present response. Claims 16 and 17 stand withdrawn from consideration. Claim 12 was rejected under 35 U.S.C. § 112, second paragraph. Claims 1-11, 13, 14, 18, and 19 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. patent 3,952,203 to Hoppe. Claims 20-24 and 28 were rejected under 35 U.S.C. § 103(a) as unpatentable over Hoppe. Claims 29-32 and 34-38 were rejected under 35 U.S.C. § 103(a) as unpatentable over Hoppe in view of U.S. patent 5,323,012 to Auslander et al. (herein "Auslander"). Claims 15, 25, and 26 were rejected under 35 U.S.C. § 103(a) as unpatentable over Hoppe and Auslander as applied to Claims 29, 34-36, and 38, and further in view of U.S. patent 5,124,561 to Faure et al. (herein "Faure"). Claims 27 and 33 were objected to as dependent upon a rejected base claim, but were noted as allowable if rewritten in independent form to include all of the limitations of their base claims and any intervening claims.

Initially, applicants gratefully acknowledge the early indication of the allowable subject matter of Claims 27 and 33.

Addressing now the rejection of Claim 12 under 35 U.S.C. § 112, second paragraph, that rejection is traversed by the present response. More specifically, Claim 12 is amended by the present response to delete the language found indefinite therein.

Addressing now the rejection of Claims 1-11, 13, 14, 18, and 19 under 35 U.S.C. § 102(b) as anticipated by Hoppe, and the rejection of Claims 20-24 and 28 under 35 U.S.C. § 103(a) as unpatentable over Hoppe, those rejections are traversed by the present response.

It is initially noted that the independent claims are amended by the present response to clarify features recited therein. Specifically, independent Claim 1 is amended by the present response to clarify that the stage is "provided in an exposure apparatus for manufacturing a microdevice". Claim 1 also clarifies that the stage is "movable two-dimensionally, and the stage has a hole portion in which the support surface is formed". Those claim changes are fully supported by the original specification at, as non-limiting examples, page 17, lines 24-26, and page 20, line 12 et seq. The other independent claims are also similarly amended.

The above-noted features are believed to clearly distinguish over the applied art as Hoppe does not disclose or suggest a stage being two-dimensionally movable and having a hole portion in which a mounting surface to mount an object is formed. Further, Hoppe does not disclose or suggest that an object is loaded to or unloaded from a mounting surface formed in the hole portion.

In such ways, each of the currently pending claims is believed to distinguish over the teachings in Hoppe.

With respect to the further rejections based on the combination of teachings of Hoppe in view of Auslander and Hoppe in view of Auslander and Faure, those rejections are also traversed by the present response. More specifically, no teachings in Auslander or Faure are believed to overcome the above-noted deficiencies in Hoppe.

The present response also sets forth new Claims 39-42 for examination, which are believed to also distinguish over the applied art. New independent Claim 39 is also directed to a device including a stage that "has a hole portion in which the mounting surface is formed, and the stage is movable in a two-dimensional plane". As noted above such features are

believed to distinguish over the applied art. Thus, new independent Claim 39, and new Claims 40-42 dependent therefrom, are also believed to be allowable.

As no other issues are pending in this application, it is respectfully submitted that the present application is in condition for allowance, and it is hereby respectfully requested that this case be passed to issue.

Respectfully submitted,

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IN THE CLAIMS

--1. (Amended) A transfer method of transporting an object to be transferred to/from a stage provided in an exposure apparatus for manufacturing a microdevice, the method comprising:

supporting one surface of said object on a plurality of support members;

loading said object supported by said plurality of support [member] members onto a support surface of said stage, wherein the stage is movable two-dimensionally, and the stage has a hole portion in which the support surface is formed; and

withdrawing said plurality of support members from said [object] hole portion to an other surface side of said object after loading said object onto the support surface of said stage.

2. (Amended) The method according to claim 1, [wherein said supporting comprises:] further comprising:

moving relatively said object and said plurality of support members [such that contact portions of said plurality of support members are located on said one surface side of said object, the contact portions coming into contact with said object]; and

moving said plurality of support members in respective predetermined directions within a moving plane perpendicular to a direction in which said object and said support [member relatively are moved] members are relatively moved.

3. (Amended) The method according to claim 2, wherein [said supporting further comprises:

supporting said object on the contact portions of said support members by relatively] said plurality of support members are withdrawn from the hole portion by relatively moving said object and said plurality of support members, after respectively moving said plurality of support members in the respective predetermined directions.

10. (Amended) The method according to [claim 1] claim 2, wherein [said loading comprises:]

[relatively moving] the relative movement of said plurality of support members and said stage is performed so as to contact said one surface of said object with the support surface of said stage; and

moving said plurality of support members thereafter in predetermined directions within [a plane] the plane perpendicular to [a] the direction in which said support members and said stage are relatively [are] moved.

11. (Amended) The method according to claim 1, further comprising:

moving relatively said stage and said plurality of support members such that contact portions of said support members are located on said one surface side of said object supported on said stage[, the contact portion coming into contact with said object];

moving said plurality of support members in respective predetermined directions within a plane perpendicular to a direction in which said stage and said plurality of support members are relatively [are] moved; and

unloading said object from said stage by relatively moving said plurality of support members and said stage.

12. (Amended) The method according to claim 1, [further comprising:

transferring said object to a position before said supporting, said one surface of said object can be supported at the position by said plurality of support members.] wherein the object includes a mask having a circuit pattern.

13. (Amended) The method according to claim 1, further comprising:

[positioning said object to] performing a relative position adjustment between said object and said stage in a two-dimensional plane parallel to a surface of said object by relatively moving said plurality of support members and said stage along the two-dimensional plane before loading said object onto said stage, while the stage is monitored by an interferometer system.

18. (Cancelled)

19. (Amended) The apparatus according to [claim 18] claim 29, further comprising:

a second driving mechanism which drives said plurality of support members in respective directions within a plane perpendicular to said first direction.

20. (Amended) The apparatus according to claim 19, wherein openings are formed in [said object] said first object, said plurality of support members being able to be inserted/withdrawn through said openings in said first direction.

25. (Amended) The apparatus according to claim 20, wherein [said object] said first object includes a mask and a frame member, a predetermined circuit pattern being formed on said mask, said frame member being securely fixed on said mask, and said openings are formed in said frame member.

27. (Amended) The apparatus according to [claim 18] claim 29, further comprising:
an elastic member arranged on a contact portion of said support member, said contact portion coming into contact with said object.

28. (Amended) The apparatus according to [claim 18] claim 29, further comprising:
a cylindrical cover arranged around a driving shaft of said first driving mechanism.

29. (Amended) An exposure apparatus for transcribing a pattern formed on a first object onto a second object [through] with an optical system, comprising:

a stage which mounts said first object on a mounting surface, wherein the stage has a hole portion in which the mounting surface is formed, and the stage is movable in a two-dimensional plane; and

a transfer system which transports said first object to from said stage, said transfer system including

a plurality of support members which supports [one surface of] said first object; and

a first driving mechanism which [drives] moves said plurality of support members in a first direction perpendicular to the two-dimensional plane between a first position [on said one surface side of said object] and a second position [on said other surface side opposite to said one surface.], wherein the ends of the plurality of support members are positioned in the hole portion of the stage when said plurality of support members are moved to said second position by the first driving mechanism.

31. (Amended) The apparatus according to claim 30, further comprising:

an interferometer system which [manages the transport and exposure positions and a position of] monitors said stage during movement between the [transport] transportation and exposure positions.

35. (Amended) The apparatus according to claim 29, wherein [a] the mounting surface [to mount said first object] is formed on a bottom [surface of a recess portion formed in said stage.] portion of the hole portion of said stage.

36. (Amended) A method of manufacturing an exposure apparatus for transcribing a pattern formed on a first object onto a second object [through] with an optical system, comprising:

providing a first stage which mounts said first object on a mounting surface, wherein the first stage has a hole portion in which the mounting surface is formed, and the stage is movable in a two-dimensional plane:

providing a transfer apparatus which transports said first object to from said first stage, said transfer apparatus including:

a plurality of support members which supports [one surface of] said first object; and

a first driving mechanism which [drives] moves said plurality of support members in a first direction perpendicular to the two-dimensional plane between a first position [on one surface side of said object] and a second position [on said other surface side opposite to said one surface;], wherein the ends of the plurality of support members are positioned in the hole portion of the stage when said plurality of support members are moved to said second position by the first driving mechanism;

providing said optical system; and

providing a second stage which mounts said second object.

37. (Amended) The method according to claim 36, further comprising:

providing an interferometer system which manages a [transport] transportation position, an exposure position, and a position of said first stage during movement between the [transport] transportation and exposure positions, said first object being transported to/from said transfer apparatus at said transportation position, said pattern being transcribed onto said second object at said exposure position, and said first stage moving between said transportation position and said exposure position.

39.-42. (New)--

IN THE ABSTRACT

--ABSTRACT

An elevator unit [(26)] including three support members [(48c)] capable of vertically moving and rotating are arranged above a transportation position where an object [(45)] is transferred by a transfer arm [(70)]. When the object [(45)] is transferred to the transportation position, the support members [(48c)] move downward to a position [P3] and rotate in a predetermined angle α° . The support members slightly move upward to receive the object [(45)] from the arm [(70)]. When the arm withdraws, the support members [(48c)] move downward to a stage [(RST)] to place the object [(45)] on the stage. The support members [(48c)] then rotate, in the predetermined angle α° , in a direction opposite to the direction in which they rotated before, and then move upward to a position [P2]. This makes it possible to mount the object on a mount surface smoothly, without any problem, even if the mounted surface is located lower in level than the upper surface of the stage.--